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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/590,637	08/23/2006	Caiteng Zhang	2467-2	2258

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EGBERT LAW OFFICES  
412 MAIN STREET, 7TH FLOOR  
HOUSTON, TX 77002

EXAMINER
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HEINCER, LIAM J

ART UNIT	PAPER NUMBER
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1767

MAIL DATE	DELIVERY MODE
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02/15/2011

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/590,637	<b>Applicant(s)</b> ZHANG, CAITENG	
	<b>Examiner</b> LIAM J. HEINCER	<b>Art Unit</b> 1767	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 18 October 2010.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 42-72 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 42-72 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)         | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)         | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on October 18, 2010 has been entered.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 42-72 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Considering Claim 42: Claim 42 contains the newly added limitation “for immobilization of a biocarrier” in the claim. This original specification contains no support immobilization of a biocarrier and no definition for the term. The applicant has cited sections showing the immobilization of enzymes and proteins, but nothing showing that the metal chelate immobilizes a "biocarrier". While the original specification contains support for immobilization of enzymes, there is no support for the metal-polymer chelate immobilizing a bio-carrier.

Claim 1 has been amended to recite a “a biocarrier structure” The original specification does not disclose how water, the hydroxyl group containing polymer, and metal salt would react together to form a skeleton. The original specification teaches metal polymer chelates (see e.g. Figure 1), but is silent towards the incorporation of water into the structure. The original specification further does not refer to these chelates as biocarriers.

The ranges have been amended to report to five decimal places. The ranges disclosed in the original specification are never given with an accuracy greater than to two decimal places.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 42-72 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Considering Claim 42: Claim 42 claims a solution of metal polymer chelates for immobilization of a biocarrier containing the metal polymer chelate. It is not clear how the biocarrier contains a metal polymer chelate that is also being used to immobilize it. Additionally, the metal polymer chelate is said to contain the biocarrier. This creates a cyclical nature to the claims that leads to an indefinite nature to the claims.

Further, the claim recites that the biocarrier is a structure containing water, a polymer and metal salt. The claim also recites that the biocarrier is selected from a group that contains members that materially distinct from this structure such as an inorganic, a cell, or bio-tissue. It is not clear which definition of bio-carrier is controlling in the claim, or how the two definitions can mutually exist.

The claims are generally narrative and indefinite, failing to conform with current U.S. practice. They appear to be a literal translation into English from a foreign document and are replete with grammatical and idiomatic errors.

Claim 1 requires a main structure comprising water. It is not clear how water can be part of a polymer skeleton as it is a small molecule. Therefore, the manner in which the water is incorporated into the skeleton is not clear. Thus the scope of the claim is indefinite.

As the scope of the claims cannot be determined at this time, application of prior art cannot be attempted at this time.

***Allowable Subject Matter***

Based on the applicant's arguments, the applicant appears to be attempting to claim the structure of Figure 3. The office proposes the following claim based on Figure 3 which would be allowable is presented by the applicant.

"A solution of solidified metal-polymer chelates comprising:

0.1 to 99.87 percent by weight water;

0.01 to 40 percent by weight of a carboxylic acid;

0.01 to 30 percent by weight of a hydroxyl functional carbohydrate polymer;

0.01 to 30 percent by weight of a metal salt;

ammonia; and

trace amount of biological proteins;

where the ammonia, carbohydrate polymer, metal, and proteins form a amino polymer metal protein hybrid, where the metal ion acts as a bridge between the hydroxyl groups of the carbohydrate polymer and the ammonia."

The following is a statement of reasons for the indication of allowable subject matter: The prior art of record does not teach or suggest the subject matter suggested by the examiner. Ceaser (US Pat. 4,780,518) teaches a carbohydrate-ammonia-metal complex as described in Fig. 3 (Abstract). However, there is nothing in the reference to suggest using the complex in combination with biological proteins as the material is an oil absorbent material (Title). Absent improper hindsight, a person having ordinary skill in the art at the time of invention would not find it obvious to use an oil absorbent to immobilize proteins.

Cho et al. and Seid et al. (previously applied in the Non-final rejection mailed August 217, 2008) teach metal polymer chelates using chitosan as the polymer material. These references do not teach the metal ions as forming a bridge between the polymer and ammonia, as the polymers already have amine reactivity. The addition of ammonia would be redundant and therefore would not be obvious to a person having ordinary skill in the art at the time of invention.

***Response to Arguments***

Applicant's arguments filed October 18, 2010 have been fully considered but they are not persuasive, because:

A) The applicant's argument that the original specification provides support for immobilization of a bio-carrier is not persuasive. The citations by the applicant do not appear to show that metal-polymer chelates immobilize a bio-carrier comprising a metal polymer chelate. The citations are directed towards the solidification of the metal polymer chelate when contacted with enzymes or other biopolymers. Therefore the citations provide support for the metal-polymers chelates being used for the immobilization of an enzyme, rather than the immobilization of a bio-carrier.

B) The applicant's argument that the bio-carrier structure has support in the original specification is not persuasive. The citation provided by the applicant shows a structure formed by the combination of a carbohydrate with hydroxyl groups, ammonia, and the metal ion (as set forth in Figure 3). These structures do not contain water in the structure as required by the claims. The Office has suggested proper claim language for the structure described in the section cited in the applicant's arguments.

***Correspondence***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LIAM J. HEINCER whose telephone number is (571)270-3297. The examiner can normally be reached on Monday thru Friday 7:30 to 5:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Eashoo can be reached on 571-272-1197. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Liam Heincer/

Examiner, Art Unit 1767

February 11, 2011